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BOOK REVIEW

Mathematical Methods of Quantum Optics
(Springer Series in Optical Science, Vol. 79)
by Ravinder R Puri
Springer-Verlag : Berlin–Heidelberg–New York–London–Paris Tokyo–Hong kong (2001)
xiv + 285 pages, 13 figures; price : $59.95, DM 117.00 (hard cover)
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This book is particularly intended for researchers who are new in the field of Quantum Optics. It covers almost entire range of the subject. As a consequence, a new researcher may have a glimpse of the subject in a compact and self-contained form. The foundational problems, have been described chronologically in a lucid manner, starting from the postulates of Quantum Mechanics. Different mathematical tools like Operator techniques, Group theoretic techniques and eigenfunction expansion method have been outlined appropriately to develop skills of a new entrant to the discipline of Quantum Optics. Introduction to the concept of quasiprobabilities for non-classical states and the descriptions of the theory of different stochastic processes are too lucid for a beginner. However, appropriate references are given at the end of the text. So, I believe a self-determined beginner will find no problem at length. Quantisation of electromagnetic field and its statistical properties have been narrated in brief and to the point. In the last few chapters, actual physical problems in Quantum Optics have been discussed. Construction of Master equations in atom-field interactions under certain conditions have been made in an *ab-initio* manner and their simple methods of solutions are given. In the process, the author has rightly discussed the dynamics of two-level and three-level atoms in quantised electromagnetic field in the framework of a unified approach. A paradigmatic survey on a variety of linear and nonlinear dissipative systems, have also found their places in the book.

In summary, the book is a praise-worthy contribution to the field of optical sciences and deserves to draw the attention of new reserachers and experts as well.

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